

## CLAIMS

I claim:

1        1.    A method of operation for a half-duplex bus comprising:  
2            asserting a preempt signal by a first agent to indicate that the first agent  
3        has a read request pending for transmission over the half-duplex bus;  
4            sampling the preempt signal by a second agent; and  
5            relinquishing ownership of the half-duplex bus by the second agent  
6        responsive to the preempt signal.

1        2.    The method of claim 1 further comprising:  
2            sending the read request over the half-duplex bus from the first agent to  
3        the second agent.

1        3.    The method of claim 1 further comprising:  
2            returning ownership of the half-duplex bus back to the second agent;  
3            sending read data over the half-duplex bus from the second agent to the  
4        first agent.

1        4.    The method of claim 3 wherein the read data is associated with the read  
2        request.

1        5.    The method of claim 1 wherein the second agent comprises a memory  
2        controller.

1        6.    The method of claim 1 wherein the first agent comprises an input/output  
2        device.

7. A method of operation for a half-duplex bus comprising:

- sending a read return over the half-duplex bus from a first agent to a second agent;
- signaling the first agent by the second agent that the second agent has a read request pending;
- electing by the first agent a suitable point at which to preempt the read return;
- granting ownership of the half-duplex bus to the second agent;
- sending the read request from the second agent to the first agent over the half-duplex bus; and
- returning ownership of the half-duplex bus to the first agent.

8. The method of claim 7 wherein the signaling step comprises:  
asserting a request signal and a preempt signal by the second agent;  
sampling the request signal and the preempt signal by the first agent.

9. The method of claim 7 further comprising:  
determining by the first agent that a threshold indicative of imminent read starvation has been exceeded.

10. The method of claim 7 wherein the suitable point comprises a cacheline boundary.

11. The method of claim 7 wherein the granting ownership and returning ownership steps comprise a one clock period turnaround.

1        12.    The method of claim 7 wherein the first agent comprises a memory  
2    controller.

1        13.    The method of claim 12 wherein the second agent comprises an  
2    input/output bridge device.

1        14.    The method of claim 7 wherein the second agent includes an arbiter that  
2    executes an arbitration protocol.

1        15.    The method of claim 14 wherein the arbiter of the first agent also  
2    executes a preemption algorithm to elect the suitable point.

1        16.    A computer system comprising:  
2        a half-duplex bus;  
3        first and second agents coupled to the half-duplex bus, each having an  
4        arbiter that follows an algorithm to determine ownership of the half-duplex bus;  
5        first and second request lines coupled between the first and second  
6        agents, the first request line being asserted by the first agent to request  
7        ownership of the half-duplex bus from the second agent, and the second request  
8        line being asserted by the second agent to request ownership of the half-duplex  
9        bus from the first agent in accordance with the algorithm; and  
10       a preempt signal that is asserted by the second agent to indicate to the  
11      first agent that the second agent has a certain type of request pending.

1        17.    The computer system of claim 16 wherein the certain type of request is a  
2    read request.

1 18. The computer system of claim 17 wherein the second agent asserts the  
2 preempt signal during a current read return from the first agent to the second  
3 agent.

1 19. The computer system of claim 18 wherein the arbiter of the first agent  
2 responds to the preempt signal in accordance with a preemption algorithm that  
3 determines a suitable point to relinquish ownership of the half-duplex bus to the  
4 second agent.

1 20. The computer system of claim 19 wherein the suitable point comprises a  
2 cacheline boundary.

1 21. The computer system of claim 16 wherein the first agent comprises a  
2 memory controller.

1 22. The computer system of claim 21 wherein the second agent comprises  
2 an input/output device.

1 23. The computer system of claim 19 wherein execution of the preemption  
2 algorithm by the arbiter of the first agent causes the first agent to determine  
3 whether a queue of read requests awaiting service by the first agent is below a  
4 predetermined threshold.

Bob